

Table VIII

Scenario	WLL Penetration	Years to Positive Cumulative Operating Cash Flow	Internal Rate of Return	Cumulative Cash Flow Per Sub (After 10 Years; Including Investment)
1	2.5%	8	-7.0%	-\$225
2	5%	8	-2.6%	-\$70
3	7.5%	8	-4.6%	-\$97

Key variables for improving the business case return rest on the revenue side.<sup>98</sup>

However, WLL faces a paradox. Clearly, at the modeled revenue levels, returns are uninspiring. Logically one would assume entry only if greater revenue could be derived from the service at roughly the same level of costs.

The paradox lies in the fact that the model represents entry of competition to the ILEC market, and competition generally drives prices down. It is illogical to assume that the margins on long distance revenues will rise. The model assumes access charges are going to a cost basis within five years. Even if this is not correct, they certainly are not going to rise. And finally, the fixed rate of \$19.00 a month is competitive with both current ILEC pricing and costs; it is not realistic to presume that the monthly fixed rate will be raised significantly.

To show the impact of target marketing WLL service to heavy long distance users, the average minutes of use for access were modeled at twice the average rate (about 200 minutes a

---

<sup>98</sup> Given the relatively conservative cost assumptions, and more numerous cost components, the revenue side is the driver of results. On the cost side the key costs are the CIU and marketing. If the CIU is eliminated and the customer is presumed to use standard PCS handsets, the WLL service ceases to be a true ILEC substitute and is just another mobility service. If there is no marketing, there is no market penetration.

month of outbound calling). Table IX outlines the results if the WLL operator can market successfully and, on average, attract users that generate two times the norm of long distance minutes.<sup>99</sup>

Table IX

Scenario	WLL Penetration	Years to Positive Cumulative Operating Cash Flow	Internal Rate of Return	Cumulative Cash Flow Per Sub (After 10 Years; Including Investment)
1	2.5%	7	-2.5%	-\$82
2	5%	7	2.6%	\$72
3	7.5%	7	2.0%	\$45

Although the increase in long distance minutes of use helps the results, overall there is very little in these projected returns that would encourage entry into WLL service in a form that is a true substitute for wired loop services, nor much reason to believe that any positive change in pricing components is likely to occur.

A carrier may elect, however, to offer WLL services to create incremental cash flow, which could positively impact a carrier's market valuation. Although the operating cash flow takes a number of years to overcome the investment required for WLL, it is common for investment analysts to apply a multiple of cash flow for equity or acquisition pricing. Clearly, applying a terminal multiple improves the results presented above. However, the determining issue for carriers is whether the required investment for the cash flow from WLL could generate a better cash flow if it were applied to increasing mobility market penetration.

---

<sup>99</sup> The model timing anomaly as noted above for Scenario 2 also occurs for these results.

Furthermore, the announcement by AT&T that it intends to enter competitive local exchange service by employing a newly developed fixed wireless technology supports the conclusion that the case for using PCS technology for WLL is not particularly attractive. AT&T has indicated they looked closely at a number of mobile and fixed technologies available and determined that none would meet their needs.<sup>100</sup>

However, the decision by AT&T to use a fixed technology is not immune to the cost and revenue issues identified above, nor is it immune to all the qualitative issues noted below. AT&T will have to keep the cost of the technology low enough to anticipate price-based competition from the ILECs, yet still provide a very high level of service.

AT&T's CIU, described as an 18 square inch device much like a pizza box,<sup>101</sup> is still of particular concern. The WLL model has shown the cost of the CIU is a critical cost component, and, logistically, it will also be a challenge for AT&T to convince building owners to allow tenants (residential and commercial) to mount them on the outside of buildings to enable the service. The questions of how to power the CIU, providing back-up power, and maintaining batteries will still need to be addressed.

AT&T must also complete necessary technology development in a timely and successful manner. If, as expected, access charges go to cost, much of the cost saving anticipated from bypassing the ILEC may have evaporated. Given the many potential pitfalls in technology

---

<sup>100</sup> *Supra.*, note 8.

<sup>101</sup> *Id.*

development, their announced intention of commercial deployment in roughly two years may be optimistic.

E. WLL Qualitative Factors

Over the coming months and years the necessary components for providing Wireless Local Loop service in the United States will be in place. On the regulatory side, equitable interconnection arrangements and some level of number portability have been mandated and will start to occur. Spectrum will have been auctioned to service providers, and operating PCS networks will have coverage that extends to significant segments of the population. Should PCS subscribers choose not to have communication services that rely strictly on handheld cordless devices, the necessary subscriber equipment will start to come available to interface current residential wireline equipment into the wireless network,

Does this mean the current bottleneck of the wireline local exchange carriers will have been broken by wireless operators? In a word, "no."

1. Death, Taxes and Dial Tone

The ILECs have done an excellent job making phone service reliable, ubiquitous and inexpensive -- raising a significant hurdle to WLL market entrants.<sup>102</sup> Thus, the ability to offer WLL service does not necessarily translate into a desire to offer service, nor does it mean that it makes good sense to offer service. Neither is there any indication of pent-up demand for

---

<sup>102</sup> Inexpensive when compared to cable service and cellular service. CLECs who elect to enter the residential local access market and compete on price will likely find the ILECs have the ability to meet their lower prices -- despite ILEC protestations that their residential service is provided below cost and subsidized.

residential local loop service, given the ILEC's market penetration and generally high quality service.<sup>103</sup>

Furthermore, where WLL service is offered, it will not necessarily be structured as a replacement service to wired loop. It is more likely, for a number of reasons, that WLL service will be positioned as a complementary or supplementary service to wired local loop. As a replacement service, WLL is open to a number of competitive issues. Being a replacement is more expensive due to higher expectations for service quality than for mobile service or supplementary local loop service. Being a replacement also requires clearing a higher hurdle in terms of services provided.

The profit margins for WLL in the U.S. are not tremendous. In addition, flat-rate pricing is sensitive to unexpected cost spikes, such as higher than anticipated acquisition costs, or higher than expected local calling usage. Acquisition costs can inflate if CIU installation costs are more than expected, or subsequent technician visits are required. Higher than expected levels of local calling usage create additional traffic-sensitive costs (radio channel equipment, back-haul and switching) which are difficult to recover in a flat-rate pricing environment. Given an environment with no long-term operating history, new technology, and no significant pent-up demand, it is unlikely that many PCS carriers will "bet the bank" on WLL service.

With certain exceptions, CMRS carriers have not been regulated much by state regulatory bodies. With the passage of the 1996 Act, CMRS carriers seem to have even less of a

---

<sup>103</sup> Currently, 93 percent of United States households have ILEC based telephone service. See, FCC Trends in Telephone Service, *supra.*, note 56.

chance of being regulated by state utilities commissions.<sup>104</sup> However, filing to compete in the residential local loop market could certainly invite a much higher level of state regulation. States could impose such requirements as: an obligation to provide service to all who request it; a requirement of some form of low-cost lifeline service; and/or a requirement to provide service into areas that, for economic reasons, would not otherwise attract PCS service provider attention (e.g. remote rural areas). For the right to provide service with marginal profitability, a CMRS carrier could be saddled with economically unacceptable regulatory burdens.

Individually or in combination, the difficulty in attaining ILEC service levels, a flat-rate pricing structure coupled with variable costs, and the potential of added state regulatory burden, may be enough to keep some potential WLL service providers on the sidelines.

## 2. ILEC Responses To WLL Service Providers

The ILECs themselves would not likely be passive; it is unlikely they would allow a significant incursion into their former monopoly market to go unanswered. What is likely is that ILEC responses would be swift and varied. There is little to prevent current ILECs from offering a WLL product. Spectrum can be acquired by auction, or partnering with an auction winner, or even partitioning an auction winner's license. The ILEC's installed base of switching, feeder and distribution facilities, brand name recognition, and current subscriber relationships would all provide advantages to the ILEC in offering a WLL service that a start-up competitor would find difficult to overcome.

---

<sup>104</sup> There is an ongoing FCC proceeding that is determining the regulation of fixed services (such as WLL) for CMRS. See, Amendment of the Commission's Rules To Permit Flexible Service Offerings in the Commercial Mobile Radio Services, Further Notice of Proposed Rulemaking, WT Docket No. 96-6, released August 1, 1996.

The ILECs are also in a position to effectively market against WLL on two key service related issues. First, the nature of WLL service, specifically the need to contend for a radio channel to access switching (in effect competing for dial tone), makes the reliability of WLL vulnerable to negative ILEC advertising. Over the years the ILECs have made service, as symbolized by providing reliable dial tone, a commodity that is taken very much for granted by their customers. The ILECs would likely be very quick to seize on any quality shortcomings of WLL service as a promotional tool to use against their competitors.

The second key service issue is also coupled with the concept of reliable, worry-free service. In this country, most telephone users are well versed to dial 911 in an emergency with the expectation that the public service agency answering the call will know the caller's phone number and, in many cases, the address from which they are calling. Cellular and PCS network 911 capability is an issue the FCC has addressed, but is five years away from resolving.

As it currently stands, it will be the year 2001 before there is any requirement that any specific caller location data will be forwarded by the carrier to the public service answering point. The recent FCC Report and Order concerning wireless services and E911, mandates that by 2001 only 67 percent of CMRS calls be located within 125 meters.<sup>105</sup> Location within 125 meters is better than no location at all, but practically speaking it can be of limited value to emergency response units. In many cities 125 meters can be across a freeway or river, in an adjacent large multi-story dwelling, or in any one of a dozen townhouses. Between 1997 and 2001, all that is required is to identify the cell the call is coming from, which could cover an area

---

<sup>105</sup> Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, R&O and FNPRM released July 26, 1996.

in excess of 50 square miles. While the use of a CIU would eventually eliminate this issue, clearly there is concern here for personal and family safety which wireline ILECs could use against WLL service, especially if the WLL service was being considered as a replacement for wired service.

### 3. WLL In the Marketplace

Given the unresolved issues surrounding WLL service in the United States, the question to ask is, will it be available at all? The answer is almost assuredly “yes.” There are reasons PCS Carriers may elect to offer some form of WLL. First, there may be a marketing advantage in being able to offer a bundle of services that includes WLL. The expectation is not that the WLL service will be tremendously lucrative, but that the ability to offer a bundle of services will attract more high-margin mobility users than otherwise, and thereby increase revenues overall.

There are also certain niche markets that may make use of the service. Most of these uses will relegate WLL to a “second line” status, an alternative means of access to the PSTN. It should be noted that second line growth in the United States has been very active in the last few years, and is expected to continue a strong growth pattern.<sup>106</sup> Over and above the traditional needs for a second line (e.g., teenagers), there are a number of new imperatives driving the demand for additional residential local exchange access. Perhaps the most cited of these are the growth of home offices and telecommuting, coupled with increased usage of modems and facsimile machines, and access to the Internet.

---

<sup>106</sup> See, MTA-EMCI, *supra.*, note 52.



PCS may not be the most appropriate choice if data communications is the driving factor in acquiring additional access. Current dial-up wired loop data rates on average exceed PCS technology rates (28.8 kbps vs. 14.4 kbps), and though wireless speeds will eventually match current POTS dial-up, the advent of cable modems and ILEC broadband access (using Digital Subscriber Line technologies) will raise the bar and make PCS technology-based wireless data access very inefficient.

The driver to choosing wireless local loop access will be demand for a certain level of mobility. Be it merely the desire for a neighborhood cordless phone, or a second home line for business calls, mobility needs will motivate the selection of wireless. For instance, as the growing popularity of pagers for teenagers has shown, parents are looking for ways to keep track of their kids. A PCS phone could keep the household's main phone line clear and, at the same time, provide a means of reaching wandering offspring. In this case a CIU might not be needed, which makes it a more attractive proposition for the PCS carrier -- showing once again the cost of being a replacement is much higher than being a supplement.

Still, there are niches that could be served by PCS as a replacement for wired loop. An example is college students and younger working people who want their own private and consistent phone service. They may find it problematic in the wired loop environment due to roommate situations or frequent relocation of living quarters. A PCS phone with voice mail would provide a continuity of service that would give the subscriber a constant ability to be reached despite a new address or roommates monopolizing the phone.

Thus, while most PCS carriers will not aggressively market WLL as a wireline substitute in the near term, where it is eventually deployed WLL will generally be a complementary means

of access, used as a second line -- bundled with mobility service. Only small niche segments will use PCS as primary access (e.g., college students, solo professionals, or for temporary service pending the installation of wired facilities).

In sum, the PCS-based WLL technology modeled here cannot be relied upon to provide significant competition to ILECs in the near term. And, as discussed above, PCS was the most likely choice among existing technologies to provide viable ILEC competition. Alternative approaches such as the announced AT&T system may provide greater long-term hope for ILEC competition. However, the key phrase is "long-term." As noted above, the technology is, for practical purposes, still on the drawing board. While the ultimate result may be different, at best the AT&T alternative occupies the same ground as cable telephony some three or four years ago. It would be a mistake to base public policy decisions regarding ILEC regulation on such a promise

## VIII. CONCLUSION

This paper has conducted an empirical assessment of the likelihood that cable telephony and wireless technology will provide significant competition for ILEC residential services. The business cases for cable telephony and WLL are not optimistic even with conservative assumptions regarding network development costs, operating costs, market penetration and revenue growth. Positive IRRs for cable occur only when 10-year penetration is assumed to reach 20 percent. The WLL IRRs are lower than the cable telephony IRRs.

These findings do not mean that local competition from cable and wireless operators will never materialize. Cable companies may deploy telephony in certain cases. If they are successful, more widespread deployment will occur. As discussed above, even wireless

operators may deploy wireless loop service under the right set of circumstances, although the wireless services modeled here are likely to remain more of a complement than a substitute for existing local telephone services.

What the results of this study do show is that significant local competition is not “right around the corner.” The implications for public policy are significant. Given the already weak case for local residential competition, it is essential that pro-competitive public policy measures are implemented as soon as possible and are vigorously enforced. Policies premised on the inevitability of local competition are destined to fail. Allowing BOCs to enter the long distance market and deregulation of ILEC prices would be premature at this stage in the development of local competition.

At the time *ELB I* was published, the results were in conflict with the optimistic press releases and newspaper reports regarding local competition. As this is written, the press reports about local competition are extremely negative. The correct conclusion is likely somewhere in the middle. Significant local competition may well develop, but pro-competitive public policy, as well as a substantial amount of time, are necessary.

**HATFIELD ASSOCIATES, INC.**  
***Consulting in Telecommunications Technology and Economics***  
737 29th Street, Suite 200  
Boulder, Colorado 80303  
(303) 442-5395

Hatfield Associates, Inc. (HAI) is an interdisciplinary consulting and research firm serving a wide range of clients in the telecommunications field. The firm was founded in February, 1982. In the more than one decade of its existence, the firm has provided consulting and educational services in nearly all aspects of the present and future telecommunications infrastructure, including local exchange networks, cable television systems, competitive access services, land mobile and personal communications, long haul terrestrial and satellite communications, data communications, and customer premises equipment.

Principals of the firm include consultants with graduate degrees and decades of senior level experience in engineering, economics, business, and policy/regulation. HAI's services include, among others, regulatory filings and policy studies, engineering studies, expert testimony, market research, economic studies, "due diligence" support, business planning, education and system development.

Examples of recent consulting assignments include:

- Modeling the cost of providing local telephone service;
- Analyzing the potential for competitive entry into the local exchange telecommunications business, presented in a paper entitled "The Enduring Local Bottleneck: Monopoly Power and the Local Exchange Carriers";
- Testifying in several state proceedings on various aspects of competitive entry into local exchange and exchange access services;
- Assessing the technological and economic merits of various telephone companies' plans for offering video dialtone services;
- Authoring the "Telecommunications Technology" and "Utility Applications of Telecommunications" chapters, describing utility opportunities in telecommunications, of a major telecommunications report for the Electric Power Research Institute;
- Developing material on telecommunications technology for inclusion in a report on international telecommunications prepared by the Office of Technology Assessment of the U.S. Congress; and
- Telecommunications education in Central and Eastern Europe.